

**ATTACHMENT A: Letter Dated November 30, 2005 from Waste Management to U.S. DOE
Regarding Treatment of Landfill Methane & CO₂**



November 30, 2005

Via Electronic Mail

David.Conover@hq.doe.gov

Mr. David Conover
Principal Deputy Assistant Secretary
Office of Policy and International Affairs
U.S. Department of Energy
Washington, DC 20585

RE: U.S. DOE Treatment of Landfill Methane & CO₂

Dear Mr. Conover:

We are writing as a follow-up to our November 9, 2005 meeting with you in which we discussed, among other issues, the U.S. Department of Energy's (DOE) proposed treatment of landfill emissions in its revisions to the 1605(b) Voluntary Reporting of Greenhouse Gases Program. We briefly discussed the views of Waste Management, Inc. (WM) that landfills should be treated as "carbon neutral" under the 1605(b) reporting guidelines, predicated on the fact that landfills can be shown to be net greenhouse gas sinks when evaluating carbon flows through landfills. This letter provides further elaboration on the biogenic nature of methane, carbon sequestration, and the uncertainties associated with trying to measure actual landfill emissions.

DOE should consider methane produced from landfills as biogenic

Methane produced in landfills is biogenic using any standard definition of the word (e.g., Merriam Webster's Collegiate Dictionary, Tenth Edition provides the following for biogenic: "produced by living organisms <~methane production>"). There is a logical disconnect in considering anaerobically produced CO₂ from landfills as biogenic while at the same time terming methane as anthropogenic. Simply put, the source of both gases is the very same group of microorganisms. While we certainly concede that landfills and their regulatory performance standards are human constructs designed with the sole purpose of protecting human health and the environment, the methane and CO₂ generation that occurs within them are the product of a natural degradation process. We believe that the environmental and human health protection afforded by landfills is an important distinction when dealing with landfill emissions. DOE should not set up a reporting scheme that essentially penalizes managing waste within a system that was designed to minimize human health and environmental impacts. DOE would be setting itself up as the arbiter between competing environmental priorities.

Waste Management's participation in the Chicago Climate Exchange (CCX) stemmed from a fairer treatment of landfills, which are considered zero emitters of greenhouse gases. Treatment of

landfills as zero emitters reflects both a consideration of the biogenic nature of methane as produced by living organisms in a natural process, and the fact that carbon remains sequestered in landfills over very long periods of time. This segues to our second major point.

Carbon Sequestration in Landfills Should be Attributed to Landfills

A number of international and domestic protocols including the Intergovernmental Panel on Climate Change (IPCC), the U.S. Environmental Protection Agency (EPA), the Oregon Climate Trust, and the California Climate Action Registry recognize carbon storage in landfilled material as a sink in calculating carbon emissions inventories. These protocols recognize that when wastes of a biogenic origin are deposited in landfills and are not completely decomposed, the carbon that remains is effectively removed from the global carbon cycle, or sequestered.

For example, the EPA has published reports that evaluate carbon flows through landfills to estimate their net greenhouse gas emissions (USEPA 1998, 2002). The methodology EPA employed recognizes carbon storage in landfills. In these studies of municipal solid waste landfilling, EPA summed the GHG emissions from methane generation and transportation-related CO₂ emissions, and then subtracted carbon sequestration (treated as negative emissions). The projected national average of net GHG emissions for landfills was minus 0.02 MTCE/Wet Ton, showing that landfills are “carbon sinks” (USEPA 1998, Exhibit 7-6).

These same methodologies that recognize carbon storage in landfills are also employed by EPA in calculating the greenhouse gas emissions related to landfilling hardwood, yard trimmings and food scraps for the Inventory of U.S. GHG Emissions and Sinks (USEPA 2005). In EPA’s inventory for 2003, landfills are reported to have nationwide methane emissions of 131.2 Tg CO₂ equivalents (USEPA 2005, Table 8-1). For the same year, reductions (storage) of carbon dioxide in the form of landfilled hardwood and landfilled yard trimmings and food scraps are reported to amount to 155 Tg CO₂ equivalents (Table 7-5) and 10.1 Tg CO₂ equivalents (Table 7-1) respectively. This demonstrates that by using EPA procedures and attributing carbon storage to the landfill, the national greenhouse gas footprint for landfills in 2003 was estimated to be minus 33.9 Tg CO₂ equivalents, or a net carbon sink. We also note that in both instances, the national average net emissions for the landfill sector were well below the “de minimis” level (3%) that the DOE 1605(b) guidelines use to allow reporters to exclude from their inventories, emissions that are comparatively small.

Life-cycle analyses of waste management practices offer further support for the premise that landfilling biogenic carbon can result in net greenhouse gas reductions. EPA’s Municipal Solid Waste Decision Support Tool (DST), a life-cycle analysis tool that was developed to help communities optimize the environmental benefits of their waste management practices, as well as to support the EPA Climate Leaders program, includes a calculator for estimating the carbon storage potential of landfills.

Although carbon storage in forests, soils and landfills clearly has a strong influence on inventorying net GHG emissions, the exact accounting methods that should be used have not yet been addressed uniformly across protocols, as scientific and policy questions remain to be resolved. Nonetheless as we have noted, EPA currently includes estimates of carbon storage in landfills in its national GHG inventory. What is problematic for the waste management sector is that EPA has chosen to account

for carbon storage of landfilled materials under the forestry sector rather than the waste sector in its national inventory reporting, and now DOE is proposing to do the same.

While DOE guidelines provide no rationale for its approach to inventorying landfill emissions, its general approach across sectors seems to reflect an attempt to allocate net carbon emissions to point sources. Nonetheless, DOE diverges from this approach in its treatment of landfills by not attributing carbon sequestration to the appropriate point source – the landfill. The IPCC review of EPA's draft 2004 U.S. GHG Inventory takes EPA to task for similarly diverging from the point source approach, and recommends that EPA account for carbon storage of landfilled biomass in the waste sector rather than the sector associated with forestry, thus ensuring that estimates are fully and directly connected with the model on landfill emissions (UNFCCC Secretariat 2005). While the IPCC rules do not currently address carbon storage in landfills, this issue is being considered in the development of new guidelines for 2006 (K. Pingoud et al. 2004). Among the items being evaluated is the appropriateness of accounting for carbon storage associated with hardwood products disposed in landfills within the waste sector rather than the forestry sector (K. Pingoud et al. 2004).

Developing a Detailed Landfill Emissions Profile is Fraught with Difficulties

In the course of evaluating the carbon flows within landfills, most methodologies discuss the inherent uncertainties and difficulties in developing a detailed landfill emission profile. IPCC, EPA and academic studies alike, delineate the uncertainties associated with modeling estimates of waste composition and mass, methane generation potential, gas collection efficiency and methane oxidation that occurs in daily, intermediate and final landfill cover. These measurement difficulties coupled with the acknowledgement that carbon sequestration renders many landfills as carbon sinks, has resulted in many domestic and international protocols and programs either ignoring landfills as insignificant sources of GHG emissions, or treating landfills as sources of emissions reductions. We respectfully recommend that DOE do the same as it contemplates revisions to its 1605(b) guidelines.

We very much appreciate your meeting with us and look forward to continuing to work constructively with you on both the voluntary reporting program and your climate change research agenda. Please feel free to contact Kerry at (202) 639-1218 if you have any questions.

Sincerely,

Roger Green
Senior Scientist

Kerry Kelly
Director, Federal Public Affairs

References Attached

References:

Pingoud, K. et al., "Approaches for Inclusion of Harvested Wood Products in Future GHG Inventories Under the UNFCCC, and their Consistency with the Overall UNFCCC Inventory Reporting Framework," *IEA Bioenergy* (July 13, 2004). <http://www.joanneum.ac.at/iea-bioenergy-task38/publications/>

UNFCCC secretariat (2005). "United States of America, Report of the Individual Review of the Greenhouse Gas Inventory Submitted in the Year 2004" FCCC/WEB/IRI/2004/USA

USEPA 1998. Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste. EPA 530-R-98-013

USEPA 2002. Solid Waste Management And Greenhouse Gases A Life-Cycle Assessment of Emissions and Sinks, 2nd Edition. EPA530-R-02-006

USEPA 2005. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2003. EPA 430-R-05-003